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DEHYDRATED ALFALFA MEAL IN RATIONS FOR CONFINED SOWS¹

R. W. Seerley and R. C. Wahlstrom

This report is the third in a series of trials to evaluate the addition of dehydrated alfalfa meal in rations for brood sows who have been kept on concrete from birth. The previous trials were reported in the 1962 and 1963 Swine Day Reports.

This particular trial was designed to compare 0, 10 and 20% levels of dehydrated alfalfa meal in the rations and the addition of more protein, minerals and vitamins to a 10% alfalfa ration.

Experimental Procedure

In the summer of 1962, 48 weanling gilts were allotted into eight groups on the basis of breed, genetic relationship and body weight. These gilts were offspring from dams which were on the previous alfalfa study. The dam's side of these pigs' ancestry has not been off of concrete since 1958. This does not infer the gilts were on the same alfalfa level as their dams. Forty-four of these gilts were purebred Duroc and four were purebred Hampshire. The experimental treatments were: (1) control ration with no alfalfa meal, (2) 10% dehydrated alfalfa meal in the ration, (3) 10% dehydrated alfalfa meal with additional crude protein, minerals and vitamins in the ration, and (4) 20% dehydrated alfalfa meal in the ration. The grower rations shown in table 1 were self-fed to approximately 150 pounds body weight, then the gestation rations were hand-fed at the level of 4.5 pounds per head per day. Two weeks before breeding the quantity fed was increased to 5.5 pounds per head per day. After breeding the level was decreased to 4.5 pounds per head per day. The quantity of feed was again increased to 5.5 pounds when the sows had been pregnant about 70 days. Sows were group fed within each pen.

Four sows on each treatment were slaughtered after pregnant for approximately twenty-five days or it was determined they were not pregnant. The 32 other sows were kept to farrow two litters. If a sow failed to farrow, she was slaughtered and the reproductive tract was examined. On the 109th day of pregnancy the sows were moved to the farrowing quarters and fed lactation rations. The control sows were not given alfalfa meal in any of their rations. The lactation rations were similar to the gestation rations (groups 1 and 2) and all alfalfa-fed sows were given the same ration with 10% level of alfalfa meal. After the pigs were weaned at 4 weeks of age, sows were returned to their respective pens and bred to farrow a second litter.

Housing facilities provided for each lot of sows were an 8 by 14 foot house with an adjoining 14 by 12 foot concrete floor. Sows farrowed in crates in the farrowing-nursery house.

¹ Supported in part by a grant from American Dehydrators Association, Kansas City, Missouri.

Results and Discussion

The results of the two farrowings are shown in table 2. Forty-three of the 48 gilts conceived at the first breeding, but only 22 of the 30 potential litters farrowed second litters. After weaning the first litters and after breeding for the second litters, there were 8 sows that would not breed. One control sow, three 10% alfalfa sow, one 10% alfalfa (fortified) sow, and three 20% alfalfa sows failed to breed. Upon slaughter all of the reproductive tracts from these sows were similar in appearance. Uterine horns were small and avascular, and ovaries were small and infantile. Several 2 mm. follicles were on the ovaries, but there were no indications of previous ovulation or follicular development. Since these tracts were so similar in appearance, something must have been affecting the normal reproductive phenomena in these sows. It is difficult to even speculate on the underlying cause. Seven of the 8 had been fed alfalfa meal, so the alfalfa meal might be implicated in some way, yet one control sow had the same condition. If all rations were deficient of some nutrient, then more trouble would be expected with the control sows, and less with the alfalfa sows, especially those fed additional protein, minerals and vitamins or those fed 20% alfalfa rations because of the nutrient value in alfalfa meal.

Sows fed the 10% alfalfa rations consistently farrowed more pigs than the control sows and sows fed the 20% alfalfa ration. Sows fed the 10% alfalfa and 10% alfalfa-fortified rations farrowed 0.92 and 1.01 more pigs, respectively, than the control sows. Sows fed 20% alfalfa rations farrowed more pigs than the control sows in the first farrowing, but they had relatively small litters in the second farrowing. Birth weights of the first three groups were about as expected in view of the difference in litter size, but sows fed 20% alfalfa meal farrowed large pigs in both farrowings.

Sows fed the 10% alfalfa ration with fortification was the only group to wean larger litters than the control sows. Group 4 had high death loss in the first farrowing and group 2 had high death loss in the second farrowing. The 20% alfalfa group had heavier pigs at weaning than the other groups and this might be expected with relatively small litters at weaning and exceptionally large pigs at birth. It is surprising this group of sows did not wean a higher percentage of their pigs due to the big pigs at birth.

The two 10% alfalfa groups farrowed more stillborn pigs than the other groups. The three completed trials showed that alfalfa meal does not help decrease the number of stillborn pigs.

The results of this trial are presented, but no conclusions will be made until a fourth trial is completed, which will be in December of this year. Data will be combined from the four trials insofar as possible. Clearly, the results have not been consistent in every trial, but the summary of the four trials should provide good information on the experimental treatments.

Table 1. Composition of Rations

<u>Lot</u>	Weaning to 150 pounds			
	<u>1</u> lb.	<u>2 & 3</u> lb.	<u>4</u> lb.	
Ground shelled yellow corn	813	775	742	
Dehydrated alfalfa meal ^a	--	50	100	
Soybean meal	125	115	100	
Tankage	40	40	40	
Dicalcium phosphate	10	9	8	
Limestone	5	4	3	
Trace mineral salt	5	5	5	
Vitamin-antibiotic premix ^b	3	3	3	
	<u>1001</u>	<u>1001</u>	<u>1001</u>	
	150 pounds through gestation			
<u>Lot</u>	<u>1</u> lb.	<u>2</u> lb.	<u>3</u> lb.	<u>4</u> lb.
Ground shelled yellow corn	434	386	350	326
Ground oats	433	386	350	326
Dehydrated alfalfa meal ^a	--	100	100	200
Soybean meal	85	64	128	60
Meat and bone scraps	30	30	30	25
Dicalcium phosphate	2	3	13	5
Limestone	8	3	--	--
Trace mineral salt	6	6	7	6
Yellow grease	--	20	20	50
Vitamin-antibiotic premix	2 ^c	2 ^c	3 ^d	2 ^c
	<u>1000</u>	<u>1000</u>	<u>1001</u>	<u>1100</u>
<u>Calculated analysis</u>				
Crude protein, %	14.4	14.4	16.4	14.4
Calcium, %	0.71	0.70	0.88	0.73
Phosphorus, %	0.51	0.50	0.71	0.50

^a The dehydrated alfalfa meal used was guaranteed 17% crude protein, crude fat 3%, crude fiber 27% maximum and NFE 35%.

^b Premix provided 1 mg. riboflavin, 2 mg. pantothenic acid, 4.5 mg. niacin, 5 mg. choline, 5 mcg. vitamin B₁₂, 2270 U.S.P. units vitamin A, 280 U.S.P. units D₂, 0.006 gm. hygromix and 10 mg. chlortetracycline per pound of ration.

^c Premix provided 1 mg. riboflavin, 2 mg. pantothenic acid, 4.5 mg. niacin, 5 mg. choline, 4 mcg. vitamin B₁₂, 2000 U.S.P. units vitamin A, 250 U.S.P. units vitamin D₃ and 5 mg. chlortetracycline per pound of ration.

^d Premix provided 1.5 mg. riboflavin, 3 mg. pantothenic acid, 6.75 mg. niacin, 7.5 mg. choline, 6 mcg. vitamin B₁₂, 2500 U.S.P. units vitamin A, 300 U.S.P. units vitamin D₃ and 5 mg. chlortetracycline per pound of ration.

Table 2. Results of Both Farrowings

Alfalfa level, %		0	10	10 plus more protein, minerals, vitamins	20
Lot number		1	2	3	4
Number of sows ^a , first litter		8(8) ^b	7(8)	7(8)	8(8)
	second litter	7(8)	4(7)	6(7)	5(8)
Av. sow weight					
First litter					
Before farrowing		434	437	447	444
4 weeks after farrowing		382	386	390	408
Second litter					
Before farrowing		518	535	508	526
4 weeks after farrowing		489	481	448	464
Av. litter size	1	8.62	9.57	9.71	9.12
	2	8.43	9.25 ^c	9.33	7.20
	Av.	8.53	9.45	9.54	8.38
Av. pig weight, lb.	1	3.06	2.93	3.03	3.46
	2	3.03	2.68	2.91	3.78
	Av.	3.05	2.84	2.98	3.56
Av. litter size, 4 weeks	1	7.00	7.50	7.14	6.50
	2	5.71	4.75	6.67	5.40
	Av.	6.40	5.82	6.92	6.08
Av. pig wt. at 4 weeks	1	13.2	13.0	13.9	14.9
	2	15.7	16.1	16.4	19.7
	Av.	14.2	13.9	15.0	16.5
Stillborn pigs per litter	1	0.88	0.29	0.88	0.38
	2	0.86	3.20	1.67	1.60
	Av.	0.87	1.50	1.31	0.85
No. sows slaughtered 25 days after bred		2 ^d	4	4	3 ^e
Av. no. corpora lutea		13.6	15.2	17.5	15.0
Av. no. embryos		10.0	12.8	15.2	14.3

^a One sow failed to farrow in each of groups 2 and 3 in the first farrowing. The group 2 sow aborted 11 days before she was due to farrow. The cause could not be determined. The group 3 sow was bred and did not have another estrus. When she did not show pregnancy, she was slaughtered and the reproductive tract appeared functional and normal. All 8 sows failing to breed for their second litters had small, infantile uterine horns and ovaries.

^b Number in parenthesis represents the number of possible litters.

^c One litter of 12 pigs aborted near termination of normal pregnancy was not included.

^d Two sows were not pregnant. One sow had a poorly developed uterus and the other sow had infantile ovaries and enlarged oviducts.

^e The non-pregnant sow had 17 functional corpora lutea and numerous 2-5 mm. follicles. Since she did not have another estrus after breeding, she probably was not cycling.